HIV

Prevention interventions for HIV positive individuals

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A public health priority

Historically, HIV prevention initiatives have focused almost entirely on encouraging "harm reduction" behaviour in diverse at-risk HIV seronegative populations. Consequently, a growing number of behavioural interventions have been tested and applied to reduce HIV associated risk behaviours across diverse at-risk groups.[1 2] In general, these programmes are theory driven and emphasise the development of cognitive, social, and technical competencies and skills associated with safer sex and drug use practices, and they attempt to modify individuals' perceptions of peer norms as supporting HIV preventive practices.[2] While designing effective risk reduction programmes for at-risk populations is a public health priority, one population that has been understudied and underserved with respect to sexual risk reduction prevention interventions is people living with HIV.

The HIV pandemic continues unabated. Globally, an estimated 36 million people are currently living with HIV.[3] In the developing world, recent advances in HIV therapy have markedly decreased HIV associated mortality and HIV is now viewed as a chronic disease.[4] However, unlike most other chronic diseases, HIV is also an infectious disease that can be transmitted to others. Thus, programmes specifically designed to address the needs of people living with HIV are essential for curtailing the HIV epidemic and should be a public health priority.[5–9] Indeed, it should be axiomatic that prevention does not stop with HIV infection. Quite the contrary, prevention efforts should be intensified for those individuals living with HIV as, ultimately, only infected individuals can transmit HIV.[5]

There are several compelling clinical and public health reasons to design and implement sexual risk reduction prevention programmes for HIV positive individuals. Firstly, there is cogent empirical evidence suggesting that sexual risk behaviours, although often reduced by many HIV positive individuals, remain prevalent. As many as one in three HIV infected people continue to practise unprotected anal and vaginal intercourse after knowing their HIV positive serostatus; intercourse often occurring with partners with unknown serostatus or who are known to be HIV negative.[10–18] Other studies of STI acquisition among HIV positive women and men strongly suggest that risk behaviours do not necessarily abate with knowledge of an HIV positive serostatus.[19–21] For example, Zenilman and colleagues found similarly high rates of STIs among HIV seropositive and HIV seronegative patients subsequent to HIV post-test counselling.[19]

Secondly, the enhanced wellbeing associated with the improved health status of people who are receiving antiretroviral therapy may be associated with an increase in unprotected sexual intercourse which could place the individual at risk of acquiring STIs.[22–24] The recent resurgence of syphilis among HIV infected men who have sex with men in cities across the United States[25] may reflect an increase in risky sexual behaviours among HIV infected people.

> Studies are needed to assess and quantify the interplay between the diverse array of biological, developmental, relational, social, psychological, cultural, and environmental influences that underlie the adoption and maintenance of sexual risk behaviour

Thirdly, a high prevalence and incidence of STIs has been observed among people living with HIV, though rates vary markedly across studies.[18 26–28] While STIs are a serious health condition, they also act as cofactors amplifying HIV transmission dynamics between the HIV positive individual and their HIV negative partner, an interaction termed epidemiological synergy.[29 30] There is now clear and compelling epidemiological evidence that STIs which cause either genital ulceration or mucosal inflammation increase the risk of HIV transmission.[31–33] The biological mechanisms through which STIs enhance HIV transmission dynamics are varied. STIs may increase the concentration of HIV in genital secretions,[34] the number of cells receptive to HIV,[35] or the number of receptors per cell.[36] Irrespective of the biological mechanism involved, ultimately STIs as cofactors are of critical importance as they directly impact HIV transmission dynamics.

Finally, while the threat of exposure to and infection with other sexually transmitted pathogens is substantial, there is an additional emerging threat—namely, the threat of superinfection including infection with multidrug resistant HIV. Superinfection with multiple strains or subtypes of HIV has been documented.[37–39] Recurrent exposure to HIV among seropositive individuals who engage in high risk behaviours can have serious consequences, as superinfection is a necessary first step for viral recombination to occur. Recombination may produce more virulent viruses, drug resistant viruses, or viruses with altered cell tropism that may compromise the effectiveness of protease inhibitor combination therapy.[38 39] Additionally, recombinant viruses and superinfection can accelerate disease progression and increase the likelihood of sexual transmission by increasing virus load in the blood and genital tract. For sex partners this can have serious adverse consequences, whether the partners are HIV seronegative or HIV seropositive, as infection with a multidrug resistant strain of HIV may markedly reduce the efficacy of antiretroviral medication, severely limiting effective therapeutic options. Thus, risky sexual behaviour among people living with HIV can adversely compromise their own health as well as pose a direct threat to the health of seropositive or seronegative sex partners.

The findings suggest that many HIV positive individuals who are engaging in risky sexual behaviour are at elevated risk of STI acquisition, exposure to other, more virulent drug resistant HIV, and risk infecting HIV seronegative sex partners. High risk sexual behaviour is not, however, random, uncontrollable, or inevitable. Many factors, individual (intrapersonal), social (interpersonal), cultural, and environmental contribute to an individual's propensity to engage in sexual risk behaviour. More importantly, from a prevention perspective, many of these factors are modifiable. However, to design optimally effective prevention programmes will require an in-depth understanding of the factors that reinforce individuals' risk taking behaviour and, more importantly, the factors that motivate individuals to adopt and maintain safer sex behaviours, such as consistent condom use.

A number of cross sectional studies and, to a lesser extent, prospective studies have observed the correlates and predictors of sexual risk and protective behaviour, STI prevalence, and STI incidence. However, additional studies will be needed to systematically assess and precisely quantify the interplay between the diverse array of biological, developmental, relational, social, psychological,

cultural, and environmental influences that underlie the adoption and maintenance of sexual risk or protective behaviour.[12 16 40–47] Of particular importance, studies will need to examine the effect of emergent risk factors, such as treatment with antiretroviral therapy, on the propensity of HIV positive individuals to engage in sexual risk behaviours.[23 24] Furthermore, the challenge will be to integrate these findings into effective prevention programmes. Thus, a public health priority is the development of a research infrastructure to conceptualise, stimulate, and support the continuum of basic behavioural and prevention intervention research for HIV positive individuals.

Although targeted prevention interventions designed to influence sexual risk behaviour are important, other prevention approaches should also be a priority. For example, enhancing access to treatment,[48] integrating prevention into clinical HIV case management,[49 50] and providing interventions within the family context[51 52] may be important. Structural interventions aimed at improving social and economic conditions[53 54] may also facilitate and motivate the adoption of risk reduction practices among HIV positive individuals. As HIV infection is as much a social condition as it is a medical condition, living with HIV impacts a person's physical, social, psychological, and emotional aspects of living.[55] This may be particularly burdensome for individuals whose lives are complicated by poverty, other chronic illnesses, discrimination, and unresponsive bureaucracies. These challenges are further compounded by the stigmatising nature of HIV disease. Thus, to address the myriad of factors that may influence risky behaviour, programmes should be targeted to multiple levels of intervention, from the individual level to the superstructural level.

Interventions, at multiple levels, need to recognise that HIV positive individuals are not a homogeneous population, but rather a mosaic of subgroups. These subgroups can be differentiated on a variety of dimensions, such as type of risk behaviours, sex, sexual orientation, race, geography, and norms and values. For prevention interventions to be maximally effective, greater specificity in tailoring interventions will be necessary to more effectively target the diversity of populations, taking into account sex, sexual orientation, cultural and religious background, ethnicity, and developmental level as well as the contextual environment in which the intervention will be implemented.

There is an urgent need to redress the chasm in prevention services for HIV positive individuals. This chasm may well be a consequence of an apparent apathy towards the HIV epidemic among developed nations experiencing the transient relief brought about by the advent of effective antiretroviral therapies and the promise of an AIDS vaccine. Indeed, the phenomenon of people taking HAART and persisting in high risk sexual behaviours[56] suggests that the apathy may even exist among some of those most affected by the epidemic. Clearly, policy initiatives could be an important starting point in the dissolution of HIV associated apathy. For example, the recently published "CDC Prevention Strategic Plan Through 2005" has as one of its goals to "increase to 80% the proportion of HIV-infected people in the United States who are linked to appropriate prevention, care and treatment services by 2005."[25] If we do not accept the challenge and rise to the occasion by marshalling our fiscal resources and collective intellectual energy to provide the type and quality of services people living with HIV deserve and need, then we risk the health and wellbeing of millions who are currently infected and confront the challenges posed by HIV on a daily basis, as well as the untold number of people who will, unfortunately, become infected in the future. This is the time for a swift, determined, and coordinated response; our passivity will only result in another missed opportunity and, ultimately, perpetuate the HIV epidemic.

Key messages

(1) Emerging evidence suggests that person living with HIV may continue practising risky sexual behaviour. Thus, prevention efforts should be intensified for those individuals living with HIV as, ultimately, only infected individuals can transmit HIV
(2) Accumulating empirical evidence regarding multidrug resistance, HIV superinfection, and the intimate connections between HIV and other STIs, strongly suggests that an increased focus on HIV prevention, directed towards those who are seropositive, is timely and thus represents a vital public health response to the AIDS epidemic. Fortunately, new evidence also provides guidance in the design and nature of behavioural interventions designed to promote safer sex practices among people living with HIV
(3) In addition to prevention programmes that aim to directly intercede with people who are HIV seropositive, a number of potentially effective approaches may prove quite valuable. For example, evidence suggests that enhancing access to treatment, integrating prevention into clinical HIV case management, and providing interventions within the family context may be important. Structural interventions aimed at improving social and economic conditions may also facilitate and motivate the adoption of risk reduction practices among HIV positive individuals.

CONTRIBUTORS

RD conceived the commentary, synthesised the relevant literature, and served as lead author; GW, refinement of ideas and concepts, synthesis of literature, manuscript preparation; CdR, refinement of ideas and concepts, synthesis of literature, manuscript preparation; RAC, synthesis of literature, manuscript preparation.

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